Arriflex 235

Service Manual

Prepared for:

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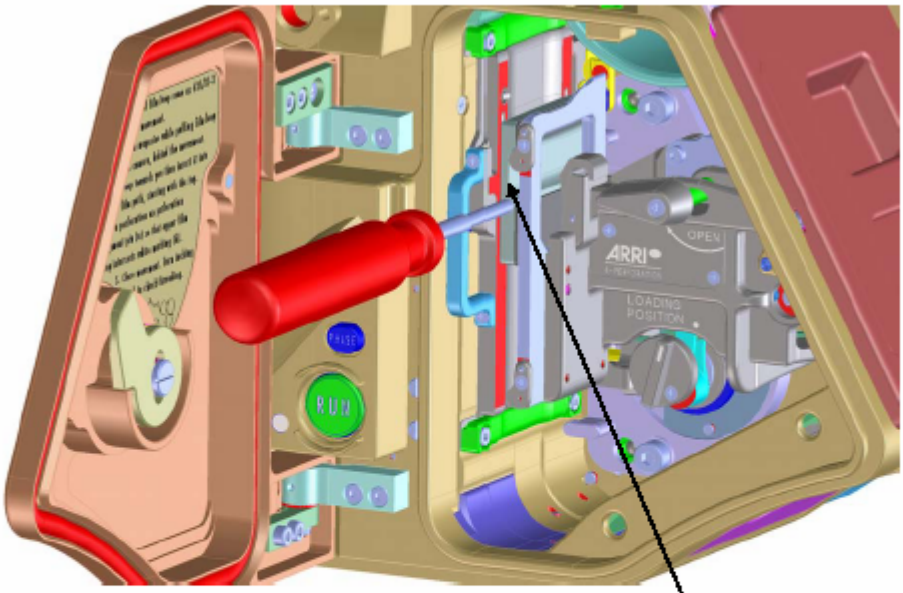
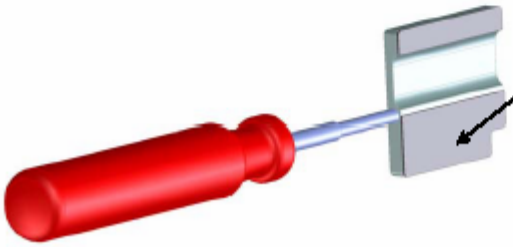
1. Mechanical:

Checking the Flange Focal Distance 51,98 -0,01 mm

Measuring and adjusting is done similar to the 435.



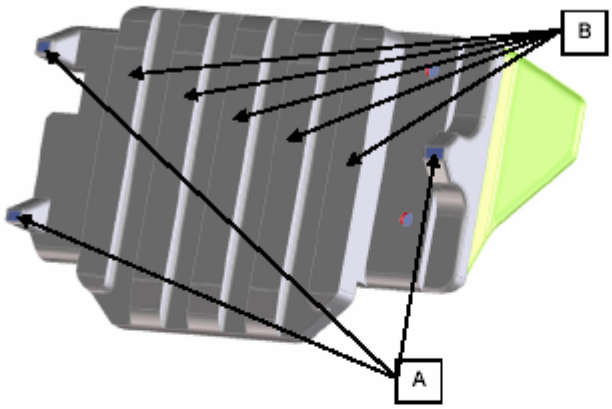
IMPORTANT: to prevent damaging, only use NEW magnetic measuring plate PV 1420 (K4.65057.0) as shown in picture below.



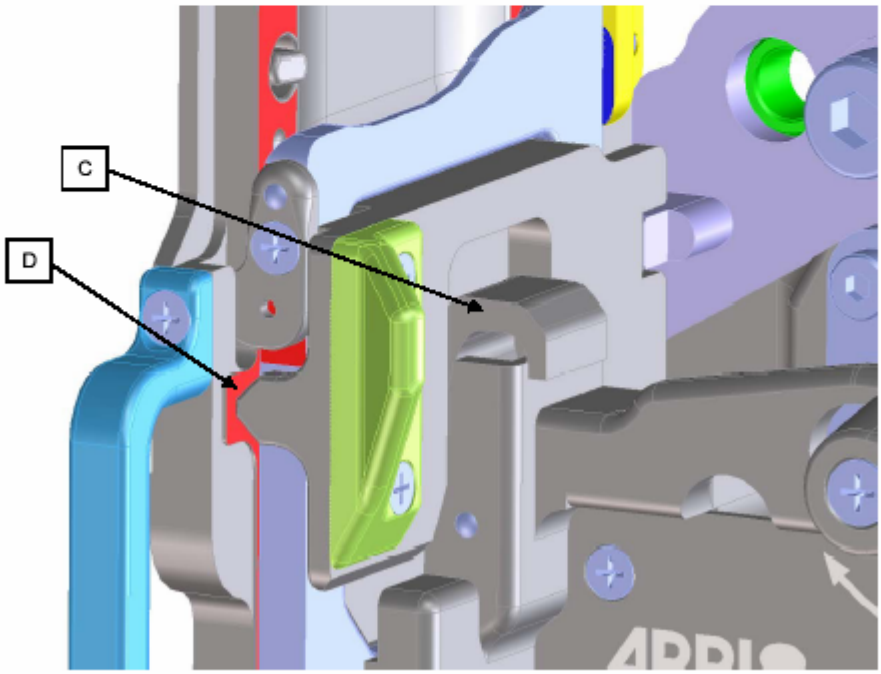
Notes regarding the new ARRIFLEX 235 spacer plate

The film gap between film gate and spacer plate is NOT adjustable!

The nominal film gap of 0.175 mm ± 0.005 mm is guaranteed by manufacturing of the spacer plate.
3 faces (A) are raised 0.175 mm in relation to the 5 ribs (B), which form the back side of the film gap.

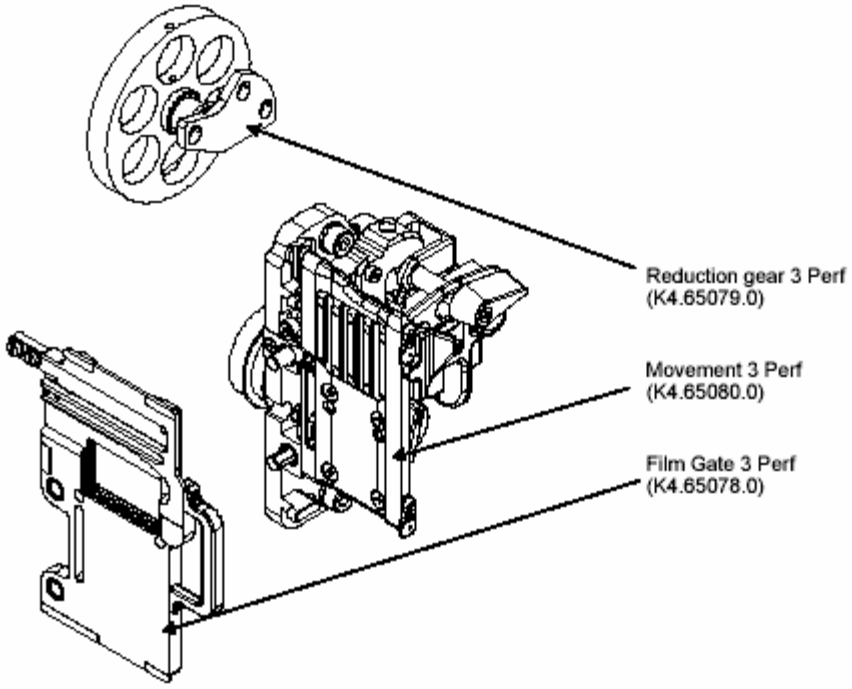


A spring loaded lever (C) presses the 3 faces on the film plane (D) of the film gate. By this means the dimension and parallelism of the film gap is guaranteed. Of course, the mating surfaces must be always kept clean!



3 Perf Conversion

The ARRIFLEX 235 3 Perf Conversion Kit (K2.55018.0, in preparation) includes:



Notes

1. 3 Perf ground glasses are not included in the 3 Perf Conversion Kit. They have to be ordered separately.

Procedure:

1. Open movement and take out the 4 Perf film gate.
2. Before opening the electronic cover turn the mirror shutter out of the lens-port area toward camera left.
3. Open electronic cover (7 screws), take care of connection between electronic cover and body, disconnect electronic cover.
4. Remove long drive belt (A)
5. Remove upper deflection roller (B) and and mount it in thread (C).
6. Untighten screws (D) of roller block.
7. Remove shutter drive belt (E) from movement pulley.
8. Remove 4 Perf reduction gear (F).
9. Remove movement (2 screws (G)) by gently pulling it off from 2 locating pins (H).
10. Install 3 Perf movement.
11. Install 3 Perf reduction gear
12. Install shutter drive belt on movement pulley.
13. Install long drive belt.
14. Adjust belt tensions:
    - apply force of 5 N (l) on roller block to tense shutter drive belt.

- Tense long drive belt in such a way, that with a test load of 4 N, belt gives way 5-6mm from tangential situation.
- Tense short drive belt (J) in such a way, that with a test load of 4 N, belt gives way 1-1.5 mm from tangential situation.

15. Install 3 Perf film gate.
16. Check flange focal distance and parallelism of film gate to PL-mount.
17. Adjust timing as described in "Adjust timing".
18. Switch electronics to 3 Perf mode:

Activation of the Service Mode

Power-on the camera.

Choose "display mode 4" by pressing the **MODE** button 3 times.
Keep the **SET** button pressed and briefly press the **SEL** button 3 times.
The display changes to Service Mode and the following display appears as long as **SET** is pressed:

```
E  25°
d  31°
```

In the 235 Service Mode exist 5 display modes altogether which can be activated in sequence by the **MODE** button.

In the individual modes, the usual run functions are available. Only differing test data is displayed.

Attention: Emergency switch-off and protective functions may be deactivated occasionally.

Press the **MODE** button repeatedly until Service display mode 2 will be displayed

Upper line: 3 or 4 perforation

```
4PErF
0000
```

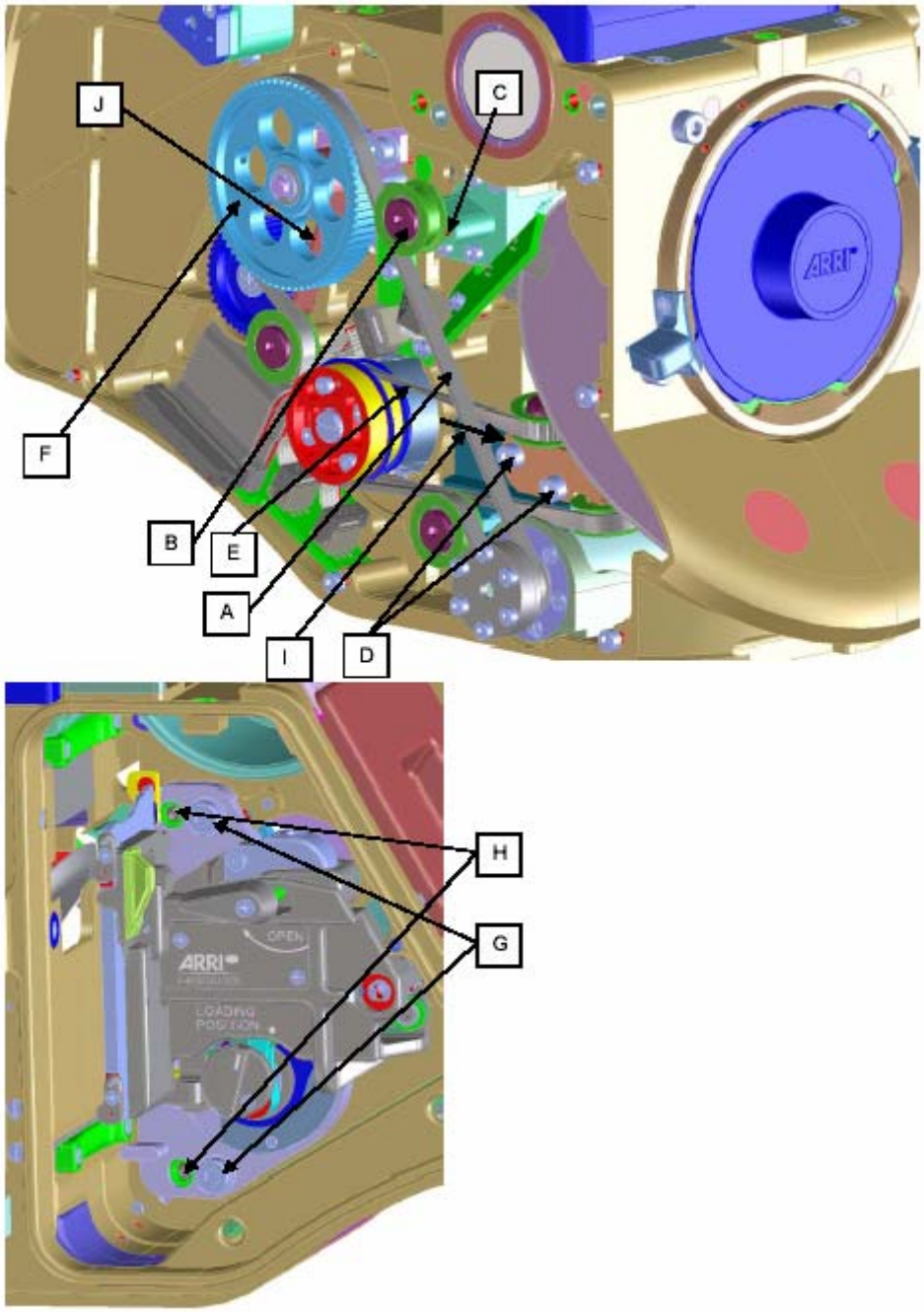
To change from 3 to 4 perforation or vice versa keep the SET button pressed down and briefly press the SEL button 4 times. The value toggles between 3 and 4.

Attention: only change this value, if you *really* want to change the movement type!

Deactivation:

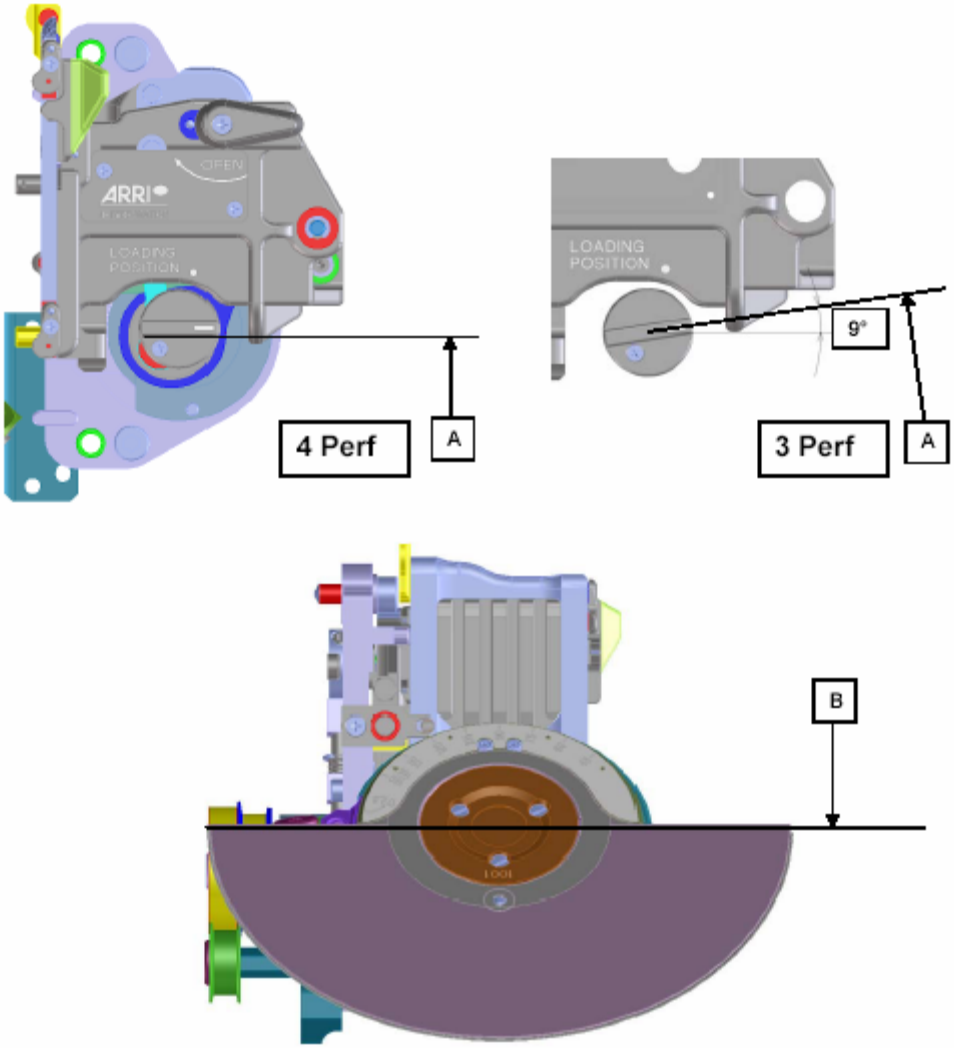
To exit from Service Mode, choose "display mode 4" again, hold the SET button pressed and briefly press SEL button one time or switch-off the camera.

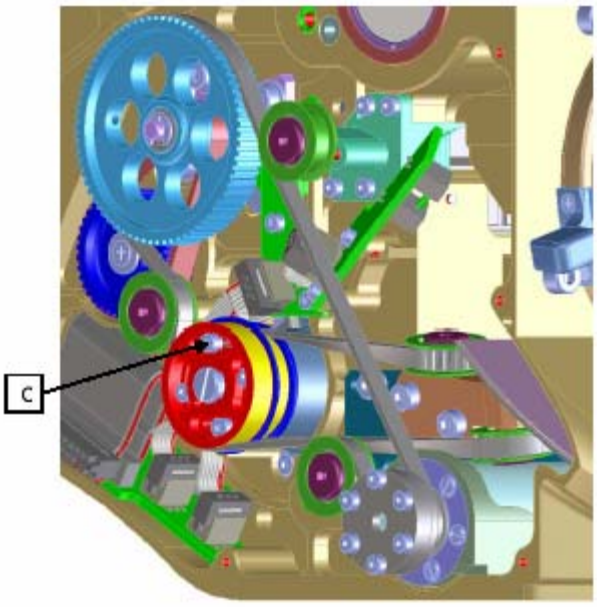
19. Shoot test film.


J
C
F
B
E
A
I
D
H
G
ARRI
OPEN
LOADING
POSITION

Adjust timing

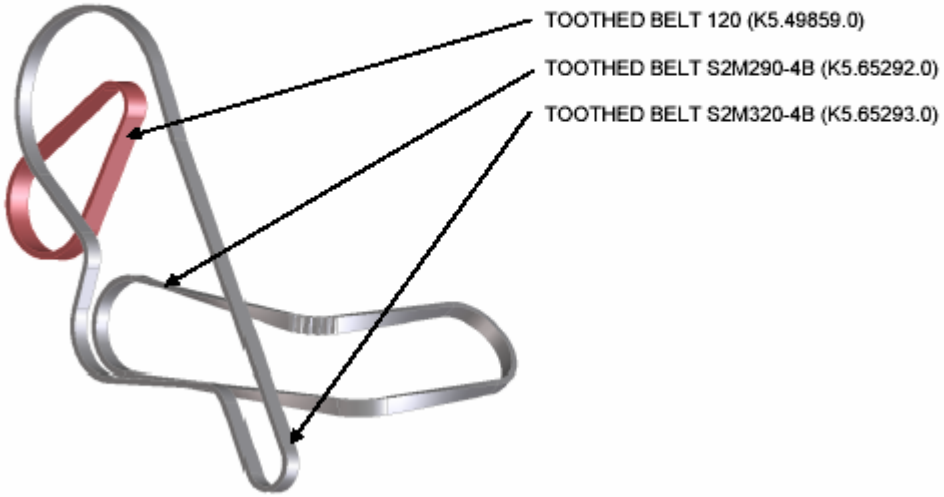
1. Untighten 4 screws (C).
2. Position inching knob in position (A). In this position the registration pin penetrates the film at it's maximum.
3. Position the mirror shutter in horizontal position (B).
4. While keeping Position A and B, tighten 4 screws (C).
5. Thread a piece of film and mark frame with a felt pen.
6. Check timing, correct timing if required.
7. Shoot a test film.





Changing drive belts

Required spare parts:



2. Electronically:

Scope

The 235 is a small, inexpensive MOS camera which is designed as a single motor cameras with timing belt drive for shutter and movement

The Main electronics of the ARRIFLEX 235 has the following interfaces and functionalities:

- Interface to the UMC-1 and UMC-3, ESU, RCU in a single mixed layout socket. The socket is designed in a way that the standard cables for the CCU-socket of the older cameras are compatible to it and it has three additional contacts for the ESU and ICU in the mid of the standard 8-pins of the CCU socket. This was done due to space restrictions.
- Two separated R/S sockets
- Optional accessory socket (for interfacing of a capping shutter and other future expansions)
- Control and power stage for the camera motor
- Display and user interface

The electronics is compatible to the following standard accessories

- UMC-1 and UMC-3
- RCU-1
- WRC-1
- ESU-1
- IVS-235

The following accessories are not compatible and must not be used on the ARRIFLEX 235

- RU
- CCU

Safety advice and conventions

The service must be carried out in a static free environment to prevent any damage to the sensitive electronics.

Disconnect the power cable before assembling, disassembling or any other work on the camera.

When it can not be avoided to run an opened camera always take care that no obstacles are in the way of moving parts.

Always wear safety glasses when running an open camera.

Do not handhold any part or touch a part of the camera while it is running.

Do not reach into the lens port.

Signals beginning with a „n" are low active signals.

Always refer to the current schematics and part lists for the latest version of the electronics.

Specifications

The electronics was designed to operate within the following limitations

Operating temperature: -20°C / +50°C

Humidity: 5% - 95% noncondensing

Altitude: 0 to 3000m

Camera speed

Magazine	Fps min	Fps max	Reverse operation
Arrimag 120	1	60	Yes
Arrimag 120S	1	60	Yes
Arrimag 300E	-	-	-
ARRI III 300m	-	-	-
ARRI III 150m	1	60	Yes
ARRI III 60m	1	60	No

300m magazines must not be used with the ARRIFLEX 235.

Operating voltage:

Nominal	20-35 volts dc
Turn on	V_{bat} > 18,4 volts (+1/-0 volts)
Undervoltage switch off	V_{bat} <18 volts (+1/-0 volts)
Not ready below	V_{bat} < 21 volts (+0.5/-0 volts)
Overvoltage	V_{bat} >37 volts (+/-1 volt)

ESU operation: 3-60fps specified

Phase jitter: less than 4% @ 24fps
as static camera (camera not moved, panned,..)

Accessory IF:

- Control Interface for ICS
- Camera Status
- CAN Bus 120 Ohms terminated
- Two motor control lines (step & direction)

Signal description: see connector description.

Speed accuracy: fps: +/-100ppm @–20to +50°C, static camera,
measurement interval >=10s.

Connector pinouts

Power supply socket 2pin Fischer E-Cover (W.W.Fischer DBP105Z087-130)			
Pin	Signal	Level / Impedance	Description
1	GND		Power supply GND
2	+24V		Power supply +24 volts

R/S sockets E-Cover (W.W. Fischer DBP102A052-130)			
Pin	Signal	Level / Impedance	Description
1	GND-AUX		Power supply GND
2	24V-AUX		Power supply +24 volts nom. (electronically fused, not stabilized)
3	R/S	I/O	Multilevel R/S Signal according to ARRI specifications

Accessory socket 11pin E-Cover (W.W Fischer DBP104A114-130) The pinout is different to the W.W. Fischer factory drawings to maintain continuity with the standard 8-pin Fischer CCU socket			
Pin	Signal	Level / Impedance	Description
1 (W.W. Fischer pin 4)	CCU-TXD	RS232	Serial interface to the RCU/CCU
2 (W.W. Fischer pin 5)	CCU-RXD	RS232	Serial interface to the RCU/CCU
3 (W.W. Fischer pin 6)	24V-AUX		Power supply +24 volts nom. (electronically fused, not stabilized)
4 (W.W. Fischer pin 7)	GND-AUX		Power supply GND
5 (W.W. Fischer pin 8)	n.c.		Currently not used / do not connect
6 (W.W. Fischer pin 9)	S-SEKTOR	TTL Out	Shutter signal (was the I/O signal on the standard CCU socket which has never been used)
7 (W.W. Fischer pin 10)	GND-AUX		Power supply GND
8 (W.W. Fischer pin 11)	PIL	TTL In	Pilot input from the ESU (was the LTC-IN signal on the standard CCU Socket)
9 (W.W. Fischer pin 1)	R/S	Multilevel	Multilevel run/stop signal according to ARRI standard
10 (W.W. Fischer pin 2)	ESU-SEL	TTL-IN	ESU detection signal
11 (W.W. Fischer pin 3)	FIST-200	TTL-OUT	200Hz / fps Signal f-ist (e.g. for the ICU)

DBP105Z087

DBP102A052

DBP104A114 (ARRI pinning : CCU +3pins)

All views from plug-in-side

3. Software update:

ARRIFLEX 235 SOFTWARE UPDATE PROCEDURE

Software update for the ARRIFLEX 235 can be done via PC – serial port.

The connection between camera and PC can be made via the following cables

K2.55011.0 KC 88-S or the

WLCC cable used for LCC connection

CAUTION: **NEVER** use CCU-cables KC-24 or KC-30 as they may damage your computer due to an additional power supply connection!

The update software as well as the latest software versions will be available via Internet via

http://www.arri.de/entry/update.htm

The packet consists of

235_Uploader.exe	PC execution file
235.ini	Control file for 235_Uploader.exe
CMC_F01xx.s19	firmware update file for CMC (Camera Main Controller)
CMC_FL01xx.mhx	flashloader update file for CMC
CMC_S01xx.mhx	main processor software update file for CMC main processor
IVS_S00xx.s19	software update file for IVS (Integrated Video System)
PIC_S01xx.s19	PIC software update file for CMC (Camera Main Controller)

xx stands for the current version

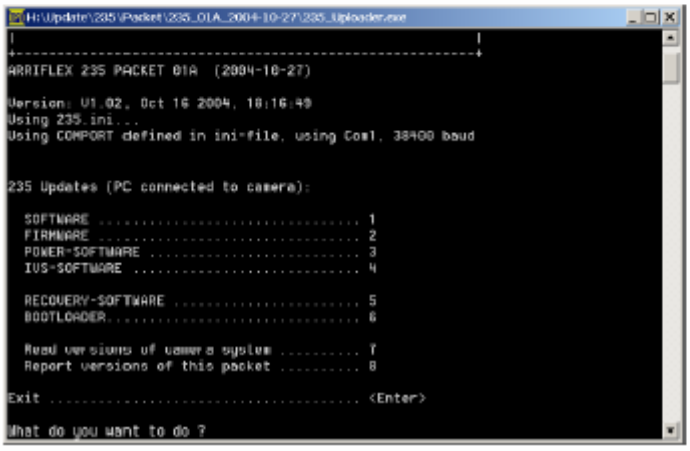
Load the update software to your PC.

Connect the update cable both on your PC 9-pin serial connector and the camera accessory connector.

Power-on your camera

Start the 235_Uploader.exe on your PC.

The following screen will appear:


ARRIFLEX 235 PACKET 01A (2004-10-27)
Version: V1.02, Oct 16 2004, 18:16:49
Using 235.ini...
Using COMPORT defined in ini-file, using Com1, 38400 baud
235 Updates (PC connected to camera):
SOFTWARE 1
FIRMWARE 2
POWER-SOFTWARE 3
IVS-SOFTWARE 4
RECOVERY-SOFTWARE 5
BOOTLOADER 6
Read versions of camera system 7
Report versions of this packet 8
Exit ..... <Enter>
What do you want to do ?

Function description:

1 SOFTWARE	loads another camera software version
2 FIRMWARE	loads another camera firmware version
3 POWER-SOFTWARE	loads another PIC-software version (responsible for power on/off behavior)
4 IVS-SOFTWARE	loads another IVS software version
5 RECOVERY-SOFTWARE	enables recovery from corrupted software, e.g. caused by power-fail during camera update
6 BOOTLOADER	loads another camera bootloader software version
7, 8	reports software / firmware versions on the screen as per description

Select the requested function by pressing the appropriate keyboard button.
The execution program starts the flashloader prior to the selected function to enable communication between camera and the PC. This will last a few seconds.

The software inside the camera will be compared to the update version and displayed on the screen. You may then decide to really update the camera (or subsystem) or not.

After the selected function has been executed, the main screen will appear again and let you select another function or exit the program by pressing the "ENTER" button on your keyboard.

Note: If the POWER-SOFTWARE update has been selected, the camera will switch off automatically after update and must be re-powered by pressing the on/off button on the camera.

Switch off your camera. With the next power-on the loaded software will be executed.

4. Tools:

Ident No.	Description	Name	Price	Notes
K4.65057.0	Measuring plate FFD	PV1420	926.00	Recommended
K4.65058.0	Film transport and channel	PV1421	3443.60	
K4.65056.0	Film gate side rails	PV1422	1604.40	
K4.65144.0	Saphire on side rails	PV1429	1214.00	
200635	SW update cable	n/a	240.00	Recommended

Note: Prices are subject to change without notice.